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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,977	02/27/2004	Kevin Torek	303.870US1	6866
21186	7590	10/05/2005		
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH 1600 TCF TOWER 121 SOUTH EIGHT STREET MINNEAPOLIS, MN 55402			EXAMINER THOMAS, TONIAE M	
			ART UNIT 2822	PAPER NUMBER

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/788,977

Applicant(s)

TOREK ET AL.

Examiner

Toniae M. Thomas

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-91 is/are pending in the application.
- 4a) Of the above claim(s) 50-91 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-17 and 24-49 is/are allowed.
- 6) ☒ Claim(s) 1,3-6 and 18-23 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. This action is a first Office action on the merits of Application Serial No. 10/788,977. Currently, claims 1-91 are pending.

***Election/Restrictions***

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-49, drawn to a process of making, classified in class 438, subclass 253.
- II. Claims 50-91, drawn to product/product-by-process, classified in class 257, subclass 306.

3. The inventions are distinct, each from the other because of the following reasons: Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by another and materially different process. For example, in another and materially different process, the collar material between adjacent memory containers is formed by blanket depositing the collar material over the storage containers; then, planarizing the collar material - using either a blanket etch-back process or a chemical mechanical polishing process to expose the top surface of each storage container.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Tim Clise on 26 July 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-49. Applicant in replying to this Office action must make affirmation of this election. Claims 50-91 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Specification***

7. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter that the applicant regards as his invention.

8. Claims 18-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The meaning of the phrase "the number of memory semiconductor" is unclear (claim 18, line 5). For purposes of examination, the phrase is interpreted to mean "the number of semiconductor containers."

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 3, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsuki (US 6,121,083).

Matsuki discloses a method for forming a memory device (figs. 8A-8D and accompanying text). The method comprises: selectively depositing a collar material 711, 713 between a number of memory containers (fig. 8A and col. 11, lines 20-24; figs. 8C, 8D and col. 11, lines 28-32)<sup>1</sup>, wherein the collar material along a side of a first memory container is in contact with the collar material

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along a side of a second memory container (fig. 8D), and wherein an opening exists between the collar material along a corner of the first memory container and the collar material along a corner of a third memory container (fig. 8D).

Each memory container includes a double-sided capacitor, wherein the double-sided capacitor comprises a front side and a back side (fig. 8A).

The double-sided capacitors comprise a conductive plug, which forms part of the lower electrode 705 (306). In some embodiments, Matsuki discloses that the conductive plug comprises polysilicon (e.g. fig. 4 and col. 7, lines 19-24).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuki in view of Nagel et al. (US 5,994,153).

Matsuki does not teach that the collar material is selectively deposited on a borophosphosilicate glass (BPSG), or on a tetraethylortho-silicate (TEOS). Instead, the collar material is deposited on a silicon oxide film 701 (fig. 8A and

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<sup>1</sup> The memory containers comprise the storage capacitors. The storage capacitors comprise lower electrodes 708, capacitive film 709, and upper electrode 710 (fig. 8A and col. 11, lines 14-19).

col. 10, lines 66-67). The silicon dioxide film, also known as undoped silicate glass, is an inter-layer dielectric (ILD).

The Nagel et al. patent (Nagel) discloses a method for forming a memory device (see figs. 10A, 10B, 11 and accompanying text). The method comprises forming an ILD layer 20 (fig. 10A and col. 15, lines 12-18). In one embodiment, the ILD is BPSG, or borophosphosilicate glass (col. 15, lines 12-18).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to replace the silicon dioxide ILD layer 20 of Matsuki with a BPSG layer, because silicon dioxide and BPSG are art-recognized equivalent materials commonly used for ILD layers in semiconductor devices.

***Allowable Subject Matter***

11. Claims 7-17 and 24-49 are allowable over the prior art of record. The prior art of record does not anticipate, teach or suggest a method substantially as claimed, wherein the method comprises at least a step of forming the containers in a mold, in BPSG material, or in TEOS.

12. Claim 18 would be allowable if rewritten or amended to overcome the rejection under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action. Additionally, claims 19-23 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim, claim 18, and any intervening claims. The prior art of record does not anticipate, teach or

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suggest a method substantially as claimed, wherein the method comprises at least a step of forming the containers in BPSG material.

13. Claim 2 is objected to as being dependent upon a rejected base claim, claim 1, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMT

28 September 2005



TONIAE M. THOMAS  
Examiner  
Art Unit 2822  
Patent and Trademark Office  
U.S. Department of Commerce